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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/697,542	10/26/2000	Kunisaburo Tomono	P/1071-1154	5711

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OSTROLENK FABER GERB & SOFFEN
1180 AVENUE OF THE AMERICAS
NEW YORK, NY 100368403

EXAMINER	
BERNATZ, KEVIN M	

ART UNIT	PAPER NUMBER
1773	

12 KB

DATE MAILED: 10/31/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

12 KB

Office Action Summary	Application No.	Applicant(s)	
	09/697,542	TOMONO ET AL.	
	Examiner	Art Unit	
	Kevin M Bernatz	1773	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *3-14 and 17-25* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *3-14 and 17-25* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Response to Amendment

1. Amendments to claims 3, 4, 9 – 14 and 17 - 25, filed on August 14, 2003, have been entered in the above-identified application.

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Examiner's Comments

3. Claims 20 – 26 appear to have the incorrect dependency. Specifically, it appears that claim 20 should depend from claim 19, not claim 3; claim 21 should depend from claim 20; and claims 22 – 26 should depend from claim 19. For purposes of evaluating the prior art, the Examiner has interpreted the claims as having the dependency described above (i.e. depending off claims 19 and 20, respectively).

Double Patenting

4. Applicant is advised that should claims 4 – 8 and 17 be found allowable, claims 20 - 26 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k). See Examiner's comments, above.

Request for Continued Examination

5. The Request for Continued Examination (RCE) under 37 CFR 1.53 (d) filed on August 14, 2003 is acceptable and a RCE has been established. An action on the RCE follows.

Claim Rejections - 35 USC § 103

6. Claims 3 – 5, 7, 8, 17, 19 – 21 and 23 – 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Watanabe et al. in view of Uchikoba ('296), Clough et al. (U.S. Patent No. 5,756,207) and Taguchi et al. (U.S. Patent No. 5,846,449).

Regarding claims 3, 4, 19 and 20, Watanabe et al. disclose a composite magnetic material comprising a sintered combination of a ferrite powder and a resin (*col. 4, lines 23 – 52 and col. 10, lines 55 – 59*) wherein said ferrite powder comprise a Ni and Co containing spinel ferrite with overlapping concentration ranges (*col. 3, lines 15 – 16 and col. 10, lines 40 – 43*). Specifically, Watanabe et al. disclose the following atomic percents for x, y and z (see also Table 1 below):

- x of 0.45 – 0.55 (*col. 3, lines 23 – 24 – "In nickel based ferrites, the content of Ni preferably ranges from about 45 to about 55 mol% calculated as NiO"*);
- y of 0 - 5 wt% (~ 0 - 7.5 atomic percent) (*col. 3, lines 26 – 28 and notes by col. 10 – i.e. if 5 wt% of CoO is added to the example in col. 10 (instead of the disclosed 0.4 wt%), the atomic percent would equal ~7.5%*);

- z of 0 – 0.40 (*col. 3, lines 25 – 26 – "Part of the nickel may be replaced by up to 40 mol% of Cu, Zn or Li or a mixture thereof"*); and
- 1-x-y-z of 0.45 – 0.55 (*col. 3, lines 23 – 26, as cited above where "nickel based ferrites" is $(NiO)(Fe_2O_3)$, which has 45-55 mol% NiO and, therefore, 55-45 mol% Fe_2O_3 and Watanabe et al. teach "[p]art of the nickel may be replaced ...", meaning the Fe_2O_3 content stays in the range of 45 – 55 mol%; see also col. 8, lines 3 – 5 and Examples teaching amounts of Fe_2O_3 within the above range*).

Table 1: Comparison of disclosed and claimed atomic percents

	$(NiO)_x$	$(CoO)_y$	$(MeO)_z$	$(Fe_2O_3)_{1-x-y-z}$
Claim 3	$0.1 \leq x \leq 0.55$	$0.05 \leq y \leq 0.20$	$0 \leq z \leq 0.20$	$0.4 \leq_{1-x-y-z} \leq 0.6$
Claim 4	$0.205 \leq x \leq 0.48$	$0.05 \leq y \leq 0.10$	$0 \leq z \leq 0.20$	$0.45 \leq_{1-x-y-z} \leq 0.55$
Watanabe et al.	$0.45 \leq x \leq 0.55$	$0 \leq y \leq 0.075$	$0 \leq z \leq 0.40$	$0.45 \leq_{1-x-y-z} \leq 0.55$
Overlap	***$0.45 \leq x \leq 0.48$***	***$0.05 \leq y \leq 0.075$***	***$0 \leq z \leq 0.2$***	***$0.45 \leq_{1-x-y-z} \leq 0.55$***

Watanabe et al. fail to explicitly disclose a single embodiment possessing all or nearly all of the claimed composition limitations simultaneously. Watanabe et al. further fail to teach the functional limitation "wherein the ferrite powder ... single domain particle".

However, Uchikoba teaches that the amount of CoO, MeO and NiO can be varied to effect the physical and mechanical properties in spinel ferrites (*Tables 1 – 3;*

col. 7, lines 53 – 62; and col. 9, lines 47 - 57). Therefore, the Examiner deems that it would have been obvious to one having ordinary skill in the art to determine an amount of CoO, MeO and NiO meeting applicants' claimed compositional limitations by optimizing the results effective variable through routine experimentation, especially given the overlapping ranges taught by Watanabe et al. and the knowledge in the art regarding the effects of varying the amount of these components as evidenced by Uchikoba above. *In re Boesch*, 205 USPQ 215 (CCPA 1980); *In re Geisler*, 116 F. 3d 1465, 43 USPQ2d 1362, 1365 (Fed. Cir. 1997); *In re Aller*, 220 F.2d, 454, 456, 105 USPQ 233, 235 (CCPA 1955).

Furthermore, Taguchi et al. teach that it is known to control spinel ferrite powders to possess a single domain state inorder to obtain good magnetic properties (*col. 1, lines 33 – 63*) and Clough et al. teach that a size of < 1 μm is desired inorder to insure single domain particles in spinel ferrites (*columns 7 – 9*).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of applicants' invention to insure that the ferrite powder of Watanabe et al. would possess single domain particles since spinel ferrites possessing single domain particles possess improved magnetic properties.

Regarding claims 5 and 21, Watanabe et al. disclose embodiments wherein z = 0 (*Table 1 above and example 3*).

Regarding claims 7, 8, 23 and 24, Watanabe et al. disclose adding Cu and/or Zn (*col. 4, lines 23 - 29*).

Regarding claims 17 and 25, Watanabe et al. disclose particle sizes meeting applicants' claimed size limitations (*col. 4, lines 33 – 35; col. 8, lines 1 – 3 and 12 – 15; and col. 10, lines 37 – 41 and lines 50 – 54*).

7. Claims 6 and 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Watanabe et al. as evidenced by applicants' admissions, and in view of Uchikoba ('296), Clough et al. ('207) and Taguchi et al. ('449) as applied above, and further in view of JP 10-335131-A. See provided Machine Translation and Derwent Abstract of JP '131 A.

Watanabe et al. as evidenced by applicants' admissions, and in view of Uchikoba ('296), Clough et al. ('207) and Taguchi et al. ('449) are relied upon as described above.

None of the above teach adding MgO in an amount greater than 0 atomic percent.

However, JP '131 A teach that Mg and Zn are known equivalents for spinel ferrites (*Paragraph 0002 wherein NiCuZn systems are directly compared to equivalent NiCuMg systems, i.e. the only difference is Zn instead of Mg*). Substitution of equivalents requires no express motivation as long as the prior art recognizes the equivalency. In the instant case, MgO and ZnO are equivalents in the field of oxides added to spinel ferrite magnetic materials. *In re Fount* 213 USPQ 532 (CCPA 1982); *In re Siebentritt* 152 USPQ 618 (CCPA 1967); *Graver Tank & Mfg. Co. Inc. v. Linde Air Products Co.* 85 USPQ 328 (USSC 1950).

It would therefore have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the device of Watanabe et al. as evidenced by applicants' admissions, and in view of Uchikoba ('296), Clough et al. ('207) and Taguchi et al. ('449) to include MgO instead of ZnO as taught by JP '131 A since MgO and ZnO are known equivalents for oxides added to spinel ferrite magnetic materials and substitution of known equivalents is within the knowledge of one of ordinary skill in the art.

8. Claims 3 – 5, 7 – 10, 12 – 14, 17 - 21 and 23 - 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP '711 A in view of Uchikoba ('296), Clough et al. ('207) and Taguchi et al. ('449). See provided English Translation of JP '711 A.

Regarding claims 3, 4, 17, 19, 20 and 25, JP '711 A disclose a composite magnetic material comprising a sintered combination of a ferrite powder and a resin (*Paragraphs 0013 - 0014*) wherein said ferrite powder comprise NiO, Fe_2O_3 and MeO atomic percents overlapping applicants' claimed ranges (see Table 2 below):

- x of 0.026 – 0.464 (*value for "a(1-x)"*),
- z of 0.013 – 0.762 (*values for "ax" and "b"*), and
- 1-x-y-z of 0.32 – 0.485 (*values for "c"*).

Table 2: Comparison of disclosed and claimed atomic percents

	$(NiO)_x$	$(CoO)_y$	$(MeO)_z$	$(Fe_2O_3)_{1-x-y-z}$
Claim 3	$0.1 \leq x \leq 0.55$	$0.05 \leq y \leq 0.20$	$0 \leq z \leq 0.20$	$0.4 \leq_{1-x-y-z} \leq 0.6$
Claim 4	$0.205 \leq x \leq 0.48$	$0.05 \leq y \leq 0.10$	$0 \leq z \leq 0.20$	$0.45 \leq_{1-x-y-z} \leq 0.55$
JP '711 A	$0.026 \leq x \leq 0.464$	$0 \leq y \leq 0.035$	$0.013 \leq z \leq 0.762$	$0.32 \leq_{1-x-y-z} \leq 0.485$
Overlap	***$0.1 \leq x \leq 0.464$***	***none***	***$0.013 \leq z \leq 0.20$***	***$0.45 \leq_{1-x-y-z} \leq 0.485$***

JP '711 A fail to disclose a CoO concentration meeting applicants' claimed limitations, teaching that CoO is expensive and that the reason to keep the concentration down below 3.5 mol% is to minimize cost (*Paragraph 0010*).

However, Uchikoba teaches that the amount of Co relative to Fe in ferrite composites can be as high as 1/6 the atomic percent (*col. 3, lines 22 – 34 and claim 1 – wherein "$Ba_3Co_2Fe_{24}O_{41}$" means $(BaO)_3(CoO)_2(Fe_2O_3)_{12}$, which is a 6:1 ratio of Fe_2O_3 to CoO*). $1/6^{th}$ of the JP '711 A Fe_2O_3 composition equals a maximum CoO amount of 8.1% (y = 0.081). The exact amount of CoO added is a cause effective variable based on the desired magnetic permeability, resistivity, bending strength (*Uchikoba; Table 1*) and Q value (*JP '711 A – Paragraph 0010 and Figure 1*).

It would, therefore, have been obvious to one having ordinary skill in the art to have determined the optimum value of a cause effective variable such as the amount of CoO through routine experimentation, especially given the teachings of JP '711 A in acceptable ranges for CoO concentration and the impact on CoO concentration on the

magnetic properties of the inductor element, especially since the only reason JP '711 A minimizes the amount of CoO is to avoid the extra expense associated with CoO.

In addition, JP '711 A fail to disclose the functional limitation "wherein the ferrite powder ... single domain particle".

However, Taguchi et al. teach that it is known to control spinel ferrite powders to a single domain state for good magnetic properties (*col. 1, lines 33 – 63*) and Clough et al. teach that a size of < 1 μm is desired inorder to insure single domain particles in spinel ferrites (*columns 7 – 9*).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of applicants' invention to insure ferrite powder possessing a particle size of 1 μm or less, and hence a single domain state, since spinel ferrites possessing single domain particles possess improved magnetic properties.

Regarding claims 5 and 21, '711 A disclose Me = Zn, where the atomic percent of Zn can equal 0, thereby meeting applicants' claimed limitations (*values for "b"*).

Regarding claims 7, 8, 23 and 24, '711 A disclose adding Cu and/or Zn (*claim*).

Regarding claims 9, 10, 12 – 14 and 18, '711 A disclose an inductor element meeting applicants' claimed limitations (*Paragraphs 0001 and 0013 - 0015*).

9. Claims 6, 11 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP '711 A in view of Uchikoba ('296), Clough et al. ('207) and Taguchi et al. ('449) as applied above, and further in view of JP '131 A. See provided Machine Translation and Derwent Abstract of JP '131 A.

JP '711 A in view of Uchikoba ('296), Clough et al. ('207) and Taguchi et al. ('449) is relied upon as described above.

None of the above teach adding MgO in an amount greater than 0 atomic percent.

However, JP '131 A teach that Mg and Zn are known equivalents for spinel ferrites (*Paragraph 0002 wherein NiCuZn systems are directly compared to equivalent NiCuMg systems, i.e. the only difference is Zn instead of Mg*). Substitution of equivalents requires no express motivation as long as the prior art recognizes the equivalency. In the instant case, MgO and ZnO are equivalents in the field of oxides added to spinel ferrite magnetic materials.

It would therefore have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the device of JP '711 A in view of Uchikoba ('296), Clough et al. ('207) and Taguchi et al. ('449) to include MgO instead of ZnO as taught by JP '131 A since MgO and ZnO are known equivalents for oxides added to spinel ferrite magnetic materials and substitution of known equivalents is within the knowledge of one of ordinary skill in the art.

Respons to Arguments

10. The rejection of claims 3 – 5, 7 and 8 under 35 U.S.C § 102(b) or 35 U.S.C § 103(a) – Watanabe et al.

The rejection of claim 6 under 35 U.S.C § 103(a) – Watanabe et al. in view of JP '131 A.

Applicant's arguments have been considered but are moot in view of the new ground(s) of rejection.

The above noted rejection under 102(b) has been withdrawn in view of applicant(s) arguments, which have been found persuasive. Specifically, applicant(s) argue that Watanabe et al. fail to disclose an embodiment possessing all of the claimed composition limitations, which is deemed to not be anticipated, nor rendered obvious, by the above noted rejection. This argument was found persuasive despite the overlapping ranges disclosed by Watanabe et al. since it was deemed that undo experimentation would be required to achieve the claimed composition, especially since Watanabe et al. was also silent regarding the desire to optimize the size of the particles to insure single domain states.

11. The rejection of claims 3 – 5, 7 – 10 and 12 - 14 under 35 U.S.C § 103(a) – JP '711 A in view of various references

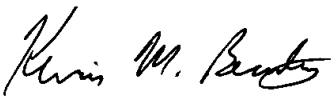
Applicant's arguments have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin M Bernatz whose telephone number is (703) 308-1737. The examiner can normally be reached on M-F, 9:00 AM - 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Thibodeau can be reached on (703) 308-2367. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.



Kevin M. Bernatz
Patent Examiner

October 27, 2003